

## PATENT ABSTRACTS OF JAPAN

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### (54) CURABLE COMPOSITION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a curable composition having excellent workability, adhesion, and heat resistance, while scarcely having toxicity, and capable of being suitably used as an adhesive which is especially improved in the adhesion to a slightly-adhesive material, such as a polyolefin material.

SOLUTION: This curable composition contains (A) a polymer having a hydrolyzable silicon-containing functional group, (B) a tackifier, (C) an acrylic polymer, and (D) a curing catalyst. An oxyalkylene polymer having the silicon-containing functional group which is cross-linkable by forming a siloxane bond is preferably used as the polymer (A).

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CLAIMS

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[Claim(s)]

[Claim 1]

(A) The polymer which has the silicon content functional group of hydrolysis nature,

(B) Tackifier,

(C) an acrylic polymer -- and

(D) The hardenability constituent characterized by containing a curing catalyst.

[Claim 2]

The hardenability constituent according to claim 1 characterized by being the oxy-alkylene polymer which has the silicon content functional group over which the above (A) can construct a bridge by forming siloxane association.

[Claim 3]

The hardenability constituent according to claim 1 characterized by being the constituent with which the above (A) consists of the oxy-alkylene polymer and (meta) acrylic-acid (\*\*) polymer which have the silicon content functional group which can construct a bridge by forming siloxane association.

[Claim 4]

The hardenability constituent of claims 1-3 given in any 1 term with which the above (B) is characterized by being a styrene system (\*\*) polymer.

[Claim 5]

The hardenability constituent of claims 1-4 characterized by the above (C) being the acrylic (\*\*) polymer to which the polymerization of the one or more sorts of acrylic ester was carried out given in any 1 term.

[Claim 6]

The hardenability constituent of claims 1-5 characterized by the above (D) being a silanol condensation catalyst given in any 1 term.

[Claim 7]

(E) The hardenability constituent of claim 1-6 characterized by adding an epoxy resin further given in any 1 term.

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[Translation done.]

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[Field of the Invention]

[0001]

About a hardenability constituent, while especially this invention is excellent in workability, an adhesive property, and thermal resistance, it relates to the hardenability constituent suitably used as adhesives which improved the adhesive property over difficulty adhesive property ingredients, such as a polyolefine ingredient, especially about few toxic hardenability constituents.

[Background of the Invention]

[0002]

A polyolefine ingredient (PE), for example, polyethylene, polypropylene (PP). Although the mixed Plastic solid containing either polyolefine copolymers, such as an ethylene propylene ternary polymerization object (EPDM), or these polyolefine ingredients etc. had the need in various fields from \*\* or before In recent years, the vinyl chloride resin used so far generates hydrogen chloride gas at the time of the incineration, on an environment, since it became clear that it is not desirable, a polyolefine ingredient is examined as an ingredient which replaces vinyl chloride resin, and the need is being extended rapidly. Although the polyolefine ingredient was a recyclable and safer ingredient, it had the problem that the adhesive property in adhesion or paint was bad.

[0003]

As adhesives used for a polyolefine ingredient, although adhesives for polyolefines, such as an urethane system, a polyester system, and an aqueous acrylic emulsion system, have so far been proposed, even if it uses these adhesives, sufficient bond strength is not obtained. Moreover, although the method of performing surface treatment, such as strong acid, the chemical treatment by the strong base, priming, corona treatment, reduced pressure plasma treatment, UV processing, and laser radiation processing, had been examined in order to raise the adhesive property in adhesion or paint of a polyolefine ingredient, there were troubles, like all have bad problem, toxic workability and adhesive property, or toxic thermal resistance.

[Patent reference 1] JP.50-156599.A

[Patent reference 2] JP.52-73998.A

[Patent reference 3] JP.62-230822.A

[Patent reference 4] JP.60-228516.A

[Patent reference 5] JP.63-112642.A

[Patent reference 6] JP.1-131271.A

[Patent reference 7] JP.55-9669.A

[Patent reference 8] JP.59-122541.A

[Patent reference 9] JP.60-6747.A

[Patent reference 10] JP.61-233043.A

[Patent reference 11] JP.3-79627.A

[Patent reference 12] JP.4-283259.A

[Patent reference 13] JP.5-70531.A

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operations is not shown in instantiation and it deviates from the technical thought of this invention, it cannot be overemphasized that various deformation is possible.

[0014]

The hardenability constituent of this invention is a hardenability constituent containing the following component (A), (B), (C), and (D).

(A) The polymer which has the silicon content functional group of hydrolysis nature

(B) Tackifier

(C) An acrylic polymer

(D) Curing catalyst

[0015]

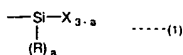
As a polymer which has the silicon content functional group of hydrolysis nature used as a (A) component in this invention The oxy-alkylene polymer which has the silicon content functional group of hydrolysis nature at a molecule non-edge which could use the well-known thing widely conventionally, for example, was proposed in the patent reference 1 - 3 grades. The constituent which becomes the oxy-alkylene polymer list which has the silicon content functional group which can construct a bridge by forming siloxane association which was proposed in the patent reference 4 - 6 grades from an acrylic-acid (meta) (\*\*) polymer can be mentioned. The constituent which becomes the oxy-alkylene polymer list which has the silicon content functional group which can construct a bridge by forming siloxane association especially proposed in the patent reference 4 - 6 grades from an acrylic-acid (meta) (\*\*) polymer is desirable in respect of an adhesion property.

[0016]

Moreover, as a polymer (A) which has the silicon content functional group of the above-mentioned hydrolysis nature, what is indicated in the patent reference 1 - 27 can be mentioned. For example, Specifically as a polymer (A) which has the silicon content functional group of the hydrolysis nature in this invention, the polyoxaalkylene polymer containing one or more cross-linking silyl radicals with which the principal chain may contain the ORGANO siloxane, respectively, a vinyl denaturation polyoxaalkylene polymer, a vinyl system polymer, a polyester polymer, an acrylic ester polymer, methacrylic acid ester polymers, these copolymers, mixture, etc. can be mentioned to intramolecular. As for a cross-linking silyl radical, it is desirable that 1 - 5 pieces are contained in intramolecular from points, such as a sealing material's hardenability and physical properties after hardening. Furthermore, as for a cross-linking silyl radical, what is shown by the following general formula (1) which is easy to construct a bridge and is easy to manufacture is desirable.

[0017]

[Formula 1]



[0018]

(Among a formula, it is a hydrocarbon group, the alkyl group of carbon numbers 1-20, the aryl group of carbon numbers 6-20, or the aralkyl radical of R of carbon numbers 7-20 is desirable, and its methyl group is the most desirable) The reactant radical shown by X may be a radical chosen from a halogen atom, a hydrogen atom, a hydroxyl group, an alkoxy group, an acyloxy radical, a KETOKISHI mate radical, an amide group, an acid-amide radical, a sulphydryl group, an alkynoxy radical, and an amino oxy-radical, and when X is plurality, X may be a radical which is different even if it was the same radical. Among these, the alkoxy group of X is desirable and its methoxy group is the most desirable a is the integer of 0, 1, or 2, and 1 is the most desirable

[0019]

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[Patent reference 14] JP.5-287188.A

[Patent reference 15] JP.11-80571.A

[Patent reference 16] JP.11-116763.A

[Patent reference 17] JP.11-130931.A

[Patent reference 18] JP.11-80571.A

[Patent reference 19] JP.11-100427.A

[Patent reference 20] JP.2000-143757.A

[Patent reference 21] JP.2000-169544.A

[Patent reference 22] JP.2002-212415.A

[Patent reference 23] The patent No. 3030020 official report

[Patent reference 24] The patent No. 3295663 official report

[Patent reference 25] The patent No. 3313380 official report

[Patent reference 26] The patent No. 3317353 official report

[Patent reference 27] The patent No. 3350011 official report

[Patent reference 28] JP.59-78223.A

[Patent reference 29] JP.2-42387.B

[Description of the Invention]

[Problem(s) to be Solved by the Invention]

[0004]

While excelling in workability, an adhesive property, and thermal resistance, there is little toxicity, and this invention aims at offering the hardenability constituent suitably used as adhesives which improved the adhesive property over difficulty adhesive property ingredients, such as a polyolefine ingredient, especially.

[Means for Solving the Problem]

[0005]

In order to solve the above-mentioned technical problem, the hardenability constituent of this invention is characterized by containing the polymer which has the silicon content functional group of (A) hydrolysis nature, the (B) tackifier, (C) acrylic polymer, and the (D) curing catalyst.

[0006]

The oxy-alkylene polymer which has the silicon content functional group which can construct a bridge by forming siloxane association as the above (A) can be used.

[0007]

It is desirable to use the constituent which consists of the oxy-alkylene polymer and (meta) acrylic-acid (\*\*) polymer which have the silicon content functional group which can construct a bridge by forming siloxane association as the above (A).

[0008]

It is suitable that the above (B) is a styrene system (\*\*) polymer.

[0009]

As the above (C), the acrylic (\*\*) polymer to which the polymerization of the one or more sorts of acrylic ester was carried out is used suitably.

[0010]

It is suitable that the above (D) is a silanol condensation catalyst.

[0011]

It is desirable to add the (E) epoxy resin further to the above-mentioned hardenability constituent.

[Effect of the Invention]

[0012]

According to this invention, while excelling in workability, an adhesive property, and thermal resistance, there is little toxicity, and the hardenability constituent suitably used as adhesives which improved the adhesive property over difficulty adhesive property ingredients, such as a polyolefine ingredient, especially can be offered.

[Best Mode of Carrying Out the Invention]

[0013]

Although the gestalt of operation of this invention is explained below, unless the gestalt of these

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The principal chain of the polymer (A) which has the silicon content functional group of the above-mentioned hydrolysis nature has desirable polyoxaalkylene polymer and/or vinyl denaturation polyoxaalkylene polymer which may contain the ORGANO siloxane from the point of physical properties, such as a \*\*\*\* adhesive property after hardening, and a modulus, and the polyoxaalkylene polymer which may contain the ORGANO siloxane, an acrylic denaturation polyoxaalkylene polymer, and/or its methacrylic denaturation polyoxaalkylene polymer are still more desirable.

[0020]

The vinyl denaturation polyoxaalkylene polymer which contains one or more cross-linking silyl radicals in the aforementioned intramolecular and which may contain the ORGANO siloxane Under existence of the polyoxaalkylene polymer which may contain the ORGANO siloxane which contains one or more cross-linking silyl radicals in intramolecular By the usual radical polymerization approaches, such as addition of a radical polymerization initiator, or UV irradiation, it can carry out carrying out a polymerization etc. and one sort or two sorts or more of vinyl system monomers can be obtained (although the patent reference 28 and 29 grades are mentioned as reference, not limited to these).

[0021]

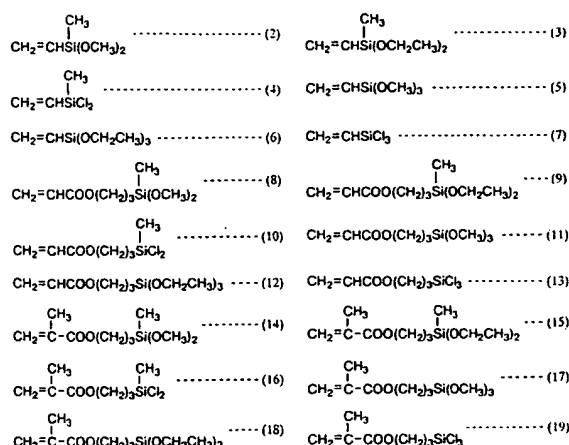
As a vinyl system monomer, it is the compound which has one or more polymerization nature unsaturated bonds in intramolecular. For example, ethylene, a propylene, an isobutylene, a butadiene, a chloroprene, A vinyl chloride, a vinylidene chloride, an acrylic acid, a methacrylic acid, vinyl acetate, Acrylonitrile, styrene, KURORU styrene, 2-methyl styrene, A divinylbenzene, a methyl acrylate, an ethyl acrylate, isobutyl acrylate, 2-ethylhexyl acrylate, acrylic-acid 2-hydroxyethyl, Acrylic-acid benzyl, glycidyl acrylate, a methyl methacrylate, Ethyl methacrylate, methacrylic-acid isobutyl, 2-ethylhexyl methacrylate, Methacrylic-acid 2-hydroxyethyl, methacrylic-acid benzyl, glycidyl methacrylate, Acrylamide, methacrylamide, n-methylol acrylamide, Ethoxylation phenol acrylate, ethoxylation PARAKU mill phenol acrylate, Ethoxylation nonyl phenol acrylate, propoxy-ized nonyl phenol acrylate, 2-ethylhexyl carbitol acrylate, an N-vinyl-2-pyrrolidone, Isobornyl acrylate, ethoxylation bisphenol F diacrylate, Ethoxylation bisphenol A diacrylate, ethoxylation isocyanuric acid diacrylate, Tripropylene glycol diacrylate, pentaerythritol diacrylate monostearate, Polyethylene-glycol diacrylate, polypropylene-glycol diacrylate, A pentaerythritol thoria chestnut rate, trimethylolpropane triacrylate, An ethoxylation isocyanuric acid thoria chestnut rate, propoxy-ized trimethylolpropane triacrylate, Ethoxylation trimethylolpropane triacrylate, dipentaerythritol pentaacrylate, Dipentaerythritol hexaacrylate, trimethylolpropanetetraacrylate, Pentaerythritol tetraacrylate, polyurethane diacrylate, Omega-carboxy-polycaprolactone monoacrylate, phthalic-acid mono-hydroxyethyl acrylate, An acrylic-acid dimer, 2-hydroxy-3-phenoxypropylacrylate, Polyester polyacrylate, 1,8-hexanediol diacrylate, 2-(2-ethoxy ethoxy) ethyl acrylate, stearylacrylate, Tetrahydrofurfuryl acrylate, laurylacrylate, 2-phenoxy acrylate, Isodecyl acrylate, iso octyl acrylate, tridecyl acrylate, Caprolactone acrylate, zinc diacrylate, 1,3-butanediol diacrylate, 1,4-butanediol diacrylate, diethylene glycol diacrylate, Triethylene glycol diacrylate, tetraethylene glycol diacrylate, Propoxy-ized neopentyl glycol diacrylate, propoxy-ized glyceryl triacrylate, Ethoxylation pentaerythritol tetraacrylate, pentaacrylate ester, Tetrahydrofurfuryl methacrylate, cyclohexyl methacrylate, Isodecyl methacrylate, lauryl methacrylate, polypropylene-glycol dimethacrylate, Triethylene glycol dimethacrylate, ethylene glycol dimethacrylate, Tetraethylene glycol dimethacrylate, polyethylene glycol dimethacrylate, 1,4-butanediol dimethacrylate, diethylene glycol dimethacrylate, 1,6-hexanedioldimethacrylate, neopentyl glycol dimethacrylate, Although each compound shown by 1,3-butanediol dimethacrylate, ethoxylation bisphenol A dimethacrylate, zinc dimethacrylate, trimethylolpropanetrimethacrylate, and following chemical formula (2) - (25) is mentioned It is not limited to these.

[0022]

[Formula 2]

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[0023]  
[Formula 3]

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adhesiveness but an adhesive property and thermal resistance raise. Phenol systems, such as terpene resin, terpene system resin; Synthetic polyterpene resin, Aromatic hydrocarbon resin, aliphatic series system hydrocarbon resin, aliphatic series system cyclic-hydrocarbon resin, Petroleum system hydrocarbon resin, such as hydrogenation hydrocarbon resin; The pentaerythritol ester of rosin or rosin, The glycerol ester of rosin, hydrogenation rosin, the wood resin hydrogenated highly, The methyl ester of hydrogenation rosin, the triethylene glycol ester of hydrogenation rosin, Rosin derivatives, such as glycerol ester of the pentaerythritol ester of hydrogenation rosin, polymerization rosin, and polymerization rosin, resin acid zinc, and hardened rosin; although the special preparation of low molecular weight polystyrene and others etc. is raised, it is not limited to them. Especially in these, a styrene system polymer and/or a styrene system copolymer are desirable. These tackifiers may be used independently and may be used together two or more sorts. (B) the blending ratio of coal of a component -- the (Component A) 100 weight section -- receiving -- \*\*\*\* for the 10 - 400 weight sections -- things are desirable, are the 30 - 300 weight section more preferably, and are the 50 - 200 weight section further more preferably, the case where the (E) epoxy resin is not specifically added -- the (Component A) 100 weight section -- receiving -- the (B) component -- \*\*\*\* for the 30 - 150 weight sections -- the case where things are suitable and add the (E) epoxy resin -- \*\*\*\* for the 70 - 200 weight sections -- things are desirable.

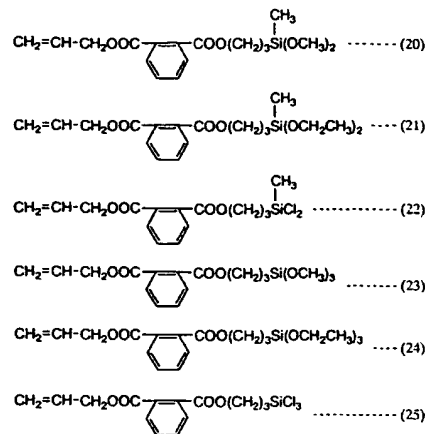
[0027]  
Although a well-known thing can be widely used conventionally as the above-mentioned styrene system (\*\*) polymer and it is not limited especially, the polymer obtained by carrying out the polymerization (\*\*) of the one or more sorts of styrene monomers, such as styrene, vinyltoluene, alpha methyl styrene, KURORU styrene, a styrene sulfonic acid, and its salt, (\*\*) is mentioned, for example. Specifically as a styrene system polymer, trade name FTR-8100 and the FTR-8120 grade by Mitsui Chemicals, Inc. can be used. Moreover, it is also possible to use the copolymer which is made to carry out copolymerization of the one or more sorts of one or more sorts and this of a styrene monomer, and other copolymerizable monomers, and is obtained as a styrene system copolymer. Especially as a copolymerizable monomer, although not limited, unsaturated compounds, such as nonconjugated diene, such as alpha olefin, 1 of 2-12, 4-pentadiene, and a dicyclopentadiene, are mentioned for carbon atomic numbers, such as 1-heptene, an ethyl-1-butene, and methyl-1-nonene, for example. Specifically as a styrene system copolymer, trade name FTR-6100, FTR-6125, and the FTR-7125 grade by Mitsui Chemicals, Inc. can be used. The above-mentioned styrene system (\*\*) polymer may be used independently, and may be used together two or more sorts.

[0028]  
(C) As an acrylic polymer used as a component, a well-known thing can be used widely conventionally, and it is not limited especially, but the acrylic (\*\*) polymer to which the polymerization of the one or more sorts chosen from acrylic monomers, such as an acrylic acid (meta), acrylic ester (meta), acrylonitrile (meta), and acrylamide (meta), was carried out can be used. It is more desirable that the acrylic (\*\*) polymer to which the polymerization of the one or more sorts of acrylic ester (meta) was carried out is mentioned as a desirable example, use an acrylic ester (meta) monomer as a principal component especially, and the carbon number of an ester part uses the acrylic ester (meta) of 1-20.

[0029]  
The carbon number of an ester part as acrylic ester (meta) of 1-20 A methyl acrylate, an ethyl acrylate (meta), acrylic acid (meta) propyl, (Meta) Acrylic-acid isopropyl, butyl acrylate (meta), isobutyl acrylate (meta), (Meta) Acrylic-acid s-butyl, acrylic-acid (meta) t-butyl, acrylic-acid (meta) neopentyl, (Meta) 2-ethylhexyl acrylate, acrylic-acid (meta) isodecyl, (Meta) Acrylic-acid (meta) alkyls, such as acrylic-acid lauryl, tridecyl acrylate (meta), and (meta) acrylic-acid stearyl, (Meta) Acrylic-acid cyclohexyl, (Meta) Acrylic-acid (meta) alicyclic alkyls, such as acrylic-acid isobornyl and (meta) acrylic-acid tricyclo decyl, (Meta) Acrylic-acid hydroxyethyl, (Meta) Acrylic-acid (meta) hydroxyalkyl, such as epison-caprolactone addition reaction object of acrylic-acid hydroxy butyl, acrylic-acid (meta) hydroxypropyl, and (meta) acrylic-acid hydroxyethyl, (Meta) Acrylic-acid 2-methoxy ethyl, (Meta) (Meta) Although hetero atom content

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[0024]

As for a vinyl system monomer, it is desirable to use it to the polyoxaalkylene polymer 100 weight section which may contain the ORGANO siloxane in the range of the 0.1 - 1000 weight section, and the further 1 - the 200 weight sections, in addition, as a vinyl denaturation polyoxaalkylene polymer which may contain the ORGANO siloxane which contains one or more cross-linking silyl radicals in intramolecular. The polyoxaalkylene polymer which contains one or more cross-linking silyl radicals in intramolecular and which may contain the ORGANO siloxane, What blended the cross-linking silyl radical content vinyl system polymer which introduces a cross-linking silyl radical into the polymer obtained by carrying out the polymerization of the one or more sorts of said vinyl system monomer, and is obtained can also be used.

[0025]

In this invention, since the viscosity before hardening is low, the narrow thing of molecular weight distribution tends to deal with especially the number average molecular weight of the polymer (A) which has the silicon content functional group of hydrolysis nature, and physical properties, such as reinforcement after hardening, elongation, and a modulus, are [ 1000 or more ] suitable for it at 6000-30000. The above-mentioned component (A) may be used only by one sort, and may be used together two or more sorts.

[0026]

(B) As an example of said tackifier which is a component to coumarone-indene resin and coumarone resin. For example, a styrene system (\*\*) polymer; Naphthene resin, Coumarone system resin; t-butylphenol-acetylene resin, such as what mixed phenol resin, rosin, etc., A degree of polymerization low The phenol formaldehyde resin of low softening temperature (about 60-100 degrees C), Xylene-phenol resin, xylene resin, the terpene-phenol resin that not only

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(meta) acrylic ester, such as acrylic-acid dimethylaminoethyl, acrylic-acid (meta) chloro ethyl, acrylic-acid (meta) trifluoroethyl, and (meta) acrylic-acid tetrahydrofurfuryl, is mentioned, it does not restrict to these. Moreover, one kind of these or two kinds or more may be used together. Since it says that a polymer with a low glass transition temperature is obtained also in the above-mentioned (meta) acrylic ester, butyl acrylate, 2-ethylhexyl acrylate, and acrylic-acid 2-methoxy ethyl are desirable.

[0030]

Moreover, it is also possible to carry out copolymerization of this and other copolymerizable monomers to an acrylic polymer in addition to the above-mentioned acrylic monomer. As a copolymerizable monomer, vinyl system monomers, such as alpha olefins, vinyl ester, and vinyl ether, are mentioned, for example.

[0031]

The glass transition temperature of the above-mentioned acrylic polymer is 10 degrees C or less, and is -10 degrees C or less still more preferably 0 degree C or less preferably. Moreover, as for weight average molecular weight, it is desirable that it is 20,000 or less and is [ or more 500 ] 10,000 or less [ 700 or more ]. If glass transition temperature is higher than 10 degrees C, the workability in low temperature will worsen. Moreover, if weight average molecular weight exceeds 20,000, since sufficient plasticity is not discovered, workability worsens, and in order that a low-molecular polymer may carry out bleeding to it being less than 500 on the other hand, stain resistance will fall. (C) the blending ratio of coal of a component -- the (Component A) 100 weight section -- receiving -- \*\*\*\* for the 10 - 200 weight sections -- things -- desirable -- \*\*\*\* for the 40 - 100 weight sections -- things are more suitable. The above-mentioned acrylic polymer may be used independently and may be used together two or more sorts.

[0032]

Although it will not be limited especially if an operation of a curing catalyst is shown to the (A) component as the above-mentioned (D) curing catalyst, it is desirable to use a silanol condensation catalyst. As a silanol condensation catalyst, for example Titanate; dibutyl tin JIRAU rates, such as tetrabutyl titanate and tetra-propyl titanate, Organic tin compound; lead octylate, such as dibutyltin maleate, dibutyl tin diacetate, tin octylate, and naphthene-acid tin; A butylamine, An octyl amine, a lauryl amine, dibutyl amine, monothanolamine, Diethanolamine, triethanolamine, diethylenetriamine, Triethylenetetramine, an oleyl amine, cyclohexylamine, Benzylamine, diethylamino propylamine, xylylene diamine, Triethylenediamine, guanidine, diphenylguanidine, 2 and 4, 6-tris (dimethyl aminomethyl) phenol, A morpholine, N-methyl morpholine, 1, 8-diazabicyclo (5,4,0) salt [ of amine system compounds, such as undecene -7 (DBU), a these, a carboxylic acid, etc., etc. ]; -- low-molecular-weight polyamide resin; obtained from superfluorous polyamine and polybasic acid -- the resultant-aminopropyl trimethoxysilane of a superfluorous polyamine and a superfluorous epoxy compound -- Well-known silanol condensation catalysts, such as a silane coupling agent which has amino groups, such as N-(beta-aminoethyl) aminopropyl methyl dimethoxysilane, are mentioned. (D) the case where a silanol condensation catalyst is used as a component -- the blending ratio of coal of a silanol condensation catalyst -- the (Component A) 100 weight section -- receiving -- \*\*\*\* for 0.1 - 20 weight sections -- things are desirable. These curing catalysts may be used independently and may use two or more sorts together.

[0033]

It is suitable for the hardenability constituent of this invention to add the (E) epoxy resin further. Although a well-known thing can be widely used conventionally as a (E) epoxy resin and it is not limited especially, it is desirable to use a bisphenol mold epoxy resin and the epoxy resin which has a polyoxaalkylene frame. Although it will not be limited as an epoxy resin which has the above-mentioned polyoxaalkylene frame especially if it has polyoxaalkylene structure, bisphenol A, Bisphenol F, bisphenol A D, and the epoxy resin that has a polyoxaalkylene unit including a novolak etc. are mentioned as a more suitable example.

[0034]

the blending ratio of coal of a (E) epoxy resin -- the (Component A) 100 weight section -- receiving -- \*\*\*\* for the 5 - 200 weight sections -- things are desirable and the 30 - 150

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weight section is still more suitable. This epoxy resin may be used independently and may use two or more sorts together.

[0035]

(E) When adding an epoxy resin, add the curing agent (epoxy resin curing agent) to this epoxy resin. As an epoxy resin curing agent, the curing agent for epoxy resins currently generally used is usable. Although not limited especially, for example Triethylenetetramine, tetraethylenepentamine, Diethylamino propylamine, N-aminoethyl PIPERASHIN, m-xylylene diamine, m-phenylenediamine, diamino diphenylmethane, diaminodiphenyl sulfone, Amines; tertiary amine salts; polyamide resin; imidazole-derivatives; ketimine; dicyandiamides; boron-trifluoride complex compounds, such as isophorone diamine, 2 and 4, and 5-tris (dimethyl aminomethyl) phenol; Phthalic anhydride, hexahydro phthalic anhydride, Tetrahydro phthalic anhydride and methylene tetrahydro phthalic anhydride, a DODESHINIRU succinic anhydride, pyromellitic dianhydride, an anhydrous KUROREN acid, etc. solve, and compounds, such as anhydrous carboxylic-acids; alcohols; phenols; carboxylic acids, are mentioned. What is necessary is just to use a curing agent suitably to the epoxy resin 100 weight section according to the purpose in the range of the 0.1 to 300 section, although the amount of the above-mentioned curing agent used changes with classes of an epoxy resin and curing agent. These curing agents may be used independently and may be used together two or more sorts. Moreover, of course, it is also possible to use what shows a curing catalyst operation to a component (A), and can serve as a curing agent of an epoxy resin as the above-mentioned curing catalyst (D) and a curing agent. [0036]

In order to adjust viscosity and physical properties in addition to the above-mentioned component, various additives, such as a bulking agent, a plasticizer, an adhesion grant agent, a stabilizer, a wax, an antioxidant, an ultraviolet ray absorbent, light stabilizer, a thixotropic agent, and a coloring agent, can be blended with the hardenability constituent of this invention if needed.

[0037]

As a plasticizer, especially if it dissolves with a polymer with process oil or other hydrocarbons, it is not limited, and various kinds of well-known plasticizers are usable. For example, dibutyl phthalate, diheptylphthalate, di(2-ethylhexyl) phthalate, Phthalic ester, such as butyl benzyl phthalate and butyl phthalyl butyl glycolate; Dioctyl adipate, Non-aromatic dibasic acid ester, such as dioctyl sebacate; Diethylene glycol dibenzoate. The ester of polyalkylene glycols, such as TORIECHIRENGURIKORUJIBENZOETO; Tricresyl phosphate, phosphoric ester [such as tributyl phosphate,]; — chloroparaffin; — alkyl diphenyl; — hydrocarbon oil [such as partial hydrogenation terphenyl,]; — process oil; — alkylbenzenes are mentioned.

[0038]

a bulking agent — for example, the usual calcium carbonate, carbon black, clay, talc, titanium oxide, calcined lime, a kaolin, a zeolite, diatomaceous earth, a vinyl chloride paste range, glass bakun, vinylidene-chloride-resin bakun, acrylonitrile methacrylonitrile resin bakun, etc. are mentioned, and independent — or it can be mixed and used.

[0039]

A silane coupling agent etc. is used as an adhesion grant agent, and a hindered phenol system compound, a triazole compound, etc. are used as a stabilizer. As a coloring agent, a titanium white, carbon black, red ochre, etc. are mentioned.

[0040]

The hardenability constituent of this invention can also be used as 1 liquid type if needed, and can also be used as 2 liquid type.

[0041]

Since the hardenability constituent which has the adhesive property which was excellent also to the polyolefine ingredient with which an adhesive property with a metal, glass, and a painted surface good from the first until now was not acquired is obtained according to this invention As for the hardenability constituent of this invention, adhering a metal, glass, and a painted surface from the first. When it is polyolefine ingredients, such as a mixed Plastic solid containing either polyolefine copolymers, such as polyethylene (PE), polypropylene (PP), and an ethylene

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acrylic, ABS, a bakelite, PET, PBT, polycarbonate nylon polyimide polyarylate Foaming objects, such as foaming styrene, urethane foam, vinyl chloride foam, and inorganic foam, Rubber, such as FRP, and NR-NBR-Si, an unvulcanized rubber, fiber, and papers Inorganic porosity base materials, such as stones, such as concrete, such as PC concrete, and a natural stone, an artificial marble, ALC, mortar, an asbestos cement sheet and a plaster board calcium silicate board, cement, fiber strengthening cement, and a clay tile, etc. can be illustrated.

[Example]

[0047]

Although an example is raised to below and this invention is explained to it still more concretely, this invention is not limited to these.

[0048]

(Examples 1-10 and example 1 of a comparison)

(Example 1)

As shown in Table 1, as a polymer which has the silicon content functional group of (A) hydrolysis nature SAIRIRU MA-470 (Kaneka Co., Ltd. make), SAIRIRU SAX-220 (Kaneka Co., Ltd. make) and MS polymer S-203H (Kaneka Co., Ltd. make), respectively 50 weight sections, 30 weight sections and 20 weight sections combination — carrying out — as the (B) tackifier — the FTR-8120(styrene system polymer: product made from Mitsui Chemicals Industry):90 weight section — And after it blended the UP-1000(Toagosei make):40 weight section, respectively and it carried out heating melting as a (C) acrylic polymer, (D) As a curing catalyst, SCAT-25(dibutyl tin diacetyl acetate: Sankyo Organic Chemicals make):4 weight section, And the KBM-603(N-beta (aminoethyl) gamma-aminopropyl trimethoxysilane: Shin-Etsu Chemical Co., Ltd. make):4 weight section which is a silane coupling agent was added, respectively, and the hardenability constituent was prepared.

[0049]

[Table 1]

propylene ternary polymerization object (EPDM), or these polyolefine ingredients, it sets to junction of the ingredient of the same class. And in junction between these dissimilar materials, usefulness is large.

[0042]

Since a good adhesive property is shown to many base materials, the hardenability constituent of this invention can be used as adhesives, a joint sealer, a sealing material, a water blocking material, a coating and a coating material, a liner, a sealing agent, adhesive tape, a pressure sensitive adhesive sheet, a pressure sensitive adhesive, an adhesion workpiece, etc.

[0043]

Since it has the balance of the rubber elasticity, adhesion endurance, shear strength, and peel strength excellent in the hardenability constituent of this invention, and warm strength when using it as adhesives, adhesion of the precision machine vessel part article with which shock resistance besides a general-purpose application is demanded, a wood flooring, and glass — adhesion between a panel nature — panel, the mirror, the panel for designs of pottery, etc. and concrete and PC concrete cement etc. Adhesion between materials with weak surface reinforcement, such as adhesion between the different-species base materials with which an thermal expansion coefficient is different, and a stone, a foaming object, glass, a mirror, an inorganic porosity base material, a clay tile, and between these material and other base materials, Adhesion of the weak material of solvent resistance, such as adhesion, organic foam, etc. which requires high endurance, such as adhesion of adhesion, tarpaulin, and absorptivity sheet of a large-sized panel, — for-beautiful-decoration lamination adhesion for a package using a plastics film, paper, aluminum foil, a vinyl chloride sheet, etc., The adhesion which requires high peel strength, such as a vinyl tile carpet sheet plastic, Adhesion of difficulty adhesion materials, such as FRP, silicone rubber, and unvulcanized-rubber engineering plastics, hemming adhesion of the adhesives for clay tile panels, and an automobile and a car, and a well — the adhesives for bond — Adhesion between the cores of honeycomb panels, such as adhesives for SMC, a steel plate, and aluminum, between a panel and a core, and between outer frames. Concrete strikes. Adhesion of the steel plate for repair / reinforcement of a splice and the adhesives for piling, and concrete. The adhesives for immobilization of the anchor bolt to concrete, the adhesives for PC block methods of construction, Adhesion between segment concrete, such as a tunnel, adhesion of the fuse tube and the vinyl chloride pipe joint for vertical water, It can use for adhesion of ferrites, such as adhesives for low-temperature heat insulation forms, and a motor loudspeaker, a core and a ferrite, and a metal plate, adhesion of lens prism, adhesion to the connection connector of an optical fiber, etc.

[0044]

As a sealing material, it can be used by the primary object for the secondary seals of a siding boat, the object for the seals of a brake lamp or a head lamp, etc.

[0045]

As a water blocking material and flooring, it can be used by the paint film water blocking material, pavement material, flooring, athletics material, etc. As a coating and coating, it is usable as the raincoat of segment concrete, an antifouling paint, and a ship bottom paint besides an elastic coating. Moreover, it can be used also as the concrete crack section and putty for crash section repair. As a liner, it is usable also as lining for corrosion prevention of concrete, a steel plate, reinforcement, etc. As a sealing agent, it can be used as sealing agents, such as a circuit, LED, etc., such as LSI.

[0046]

Especially as a base material which can be used for these applications, although not limited For example, metals, such as glass, and aluminum, a rolled plate, a stainless steel plate, a zinc processing steel plate, a chromate treatment steel plate, a phosphating steel plate, a plating processing steel plate, a tin plate, \*\*\*\*\* a copper plate, a brass plate, a zinc plate. The paint steel plate by which surface treatment was carried out in organic coatings and inorganic coatings, such as epoxy acrylic polyester. The makeup steel plate with which the laminating of the sheets plastic, such as plasticized polyvinyl chloride, a fluorine system polymer, and PET, was carried out. Plastics, such as a hoe low panel, woodwork material, and a vinyl chloride styrol

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比較例	実施例									
	1	2	3	4	5	6	7	8	9	10
(A) 加水分解性の珪素含有化合物を有する重合体 <sup>1)</sup>	50	50	50	50	50	50	50	50	50	100
(A) 加水分解性の珪素含有化合物を有する重合体 <sup>2)</sup>	30	30	30	50	50	50	50	50	50	50
(A) 加水分解性の珪素含有化合物を有する重合体 <sup>3)</sup>	20	20	20	50	50	50	50	50	50	50
(B) 粘着付与剤 <sup>4)</sup>	90	90	90	90	90	90	90	90	90	90
(B) 粘着付与剤 <sup>5)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>6)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>7)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>8)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>9)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>10)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>11)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>12)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>13)</sup>	40	40	40	40	40	40	40	40	40	40
(B) 粘着付与剤 <sup>14)</sup>	40	40	40	40	40	40	40	40	40	40

[0050]

The loadings of each quality of a compound in Table 1 are shown by the weight section, and notes 1 - the notes 14 are as follows.

\*1: Trade name: SAIRIRU MA-470 (the polymer which has the silicon content functional group of hydrolysis nature: Kaneka Co., Ltd. make)

\*2: Trade name: SAIRIRU SAX-220 (the polymer which has the silicon content functional group of hydrolysis nature: Kaneka Co., Ltd. make)

\*3: Trade name: MS polymer S-203H (the polymer which has the silicon content functional group of hydrolysis nature: Kaneka Co., Ltd. make)

\*4: Trade name: FTR-8120 (styrene system polymer: product made from Mitsui Chemicals Industry)  
\*5: Trade name: FTR-7125 (styrene system copolymer: product made from Mitsui Chemicals Industry)  
\*6: Trade name: FTR-6125 (styrene system copolymer: product made from Mitsui Chemicals Industry)  
\*7: Trade name: UP-1000 (Toagosei make)  
\*8: Trade name: ADEKA resin EP-4000 (bisphenol alkylene oxide addition epoxy resin: Asahi Denka Kogyo K.K. make)  
\*9: Trade name: ADEKAGURI sile ED-506 (polyalkylene glycol mold epoxy resin: Asahi Denka Kogyo K.K. make)  
\*10: Trade name: ADEKA resin EPU-16A (bisphenol alkylene oxide addition epoxy resin: Asahi Denka Kogyo K.K. make)  
\*11: Trade name: ADEKA resin EP-4100 (bisphenol A mold epoxy resin: Asahi Denka Kogyo K.K. make)  
\*12: Trade name: SCAT-25 (dibutyl tin diacetyl acetate: Sankyo Organic Chemicals make)  
\*13: Trade name: bar SAMIN EH-30 (2, 4, 6-tris (dimethyl aminomethyl) phenol: made in KOGUNISU Japan)  
\*14: Trade name: KBM-603 (N-beta (aminoethyl) gamma-aminopropyl trimethoxysilane: Shin-Etsu Chemical Co., Ltd. make)  
[0051]  
(Example 2)